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EXAMINER	
LERNER, MARTIN	

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Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary	Application No.	Applicant(s)	
	10/520,000	MOSSAKOWSKI, GERD	
	Examiner	**Art Unit**	
	MARTIN LERNER	2626	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE _3_ MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on _26 November 2008_.

2a)☒ This action is **FINAL**. 2b)☐ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) _1 to 7_ is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) _1 to 7_ is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☒ All b)☐ Some * c)☐ None of:

1.☒ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☒ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)

2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)

3) ☐ Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date _____.

4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .

5) ☐ Notice of Informal Patent Application

6) ☐ Other: _____.

DETAILED ACTION

Claim Rejections - 35 USC § 112

The following is a quotation of the second paragraph of 35 U.S.C. 112:

> The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

Claims 1 to 7 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

Independent claim 1 is indefinite because the limitations of “(c) combining each field of the multiplicity of fields into a field group” and “(d) forming a plurality of field groups from each individual field and at least two fields of the array adjacent to the individual field" are confusing and do not make it clear how the fields are combined. Applicant’s amendment does provide some clarification of how each field is combined, but it is maintained that step (c) of combining each field is not actually distinct from step (d) of forming a plurality of field groups. The claim could be clarified by combining steps (c) and (d) into one step as "(c) combining each field of the multiplicity of fields into a field group, where there are a plurality of field groups formed from the multiplicity of fields, and each field group is formed from at least three adjacent fields”. Thus, independent claim 1 should be amended to make it clear that the step of forming the field groups is a natural result of combining the fields, instead of implying that step (d) of

forming the field groups is something additional to what happens from combining the fields in step (c).

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

Claims 1 to 3 and 7 are rejected under 35 U.S.C. 103(a) as being unpatentable over *Atlas et al*. in view of *Yong*.

Concerning independent claim 1, *Atlas et al*. discloses a method for multiresolution scalable audio coding, comprising:

"resolving an audio signal into a number of n spectral components" – a normalized audio input signal is processed by a 2D transform; the first transform produces time varying spectral estimates (column 5, line 66 to column 6, line 4: Figure 1: Step 30); a two dimensional transform process starts with a filter bank, and a base transform process 154 provides a matrix of time samples having frequency indices k ("n spectral components") (column 8, line 1 to column 9, line 13: Figure 2);

"storing of the resolved audio signals in a two-dimensional array having a multiplicity of fields, and wherein frequency and time are stored as dimensions of the array and the amplitude as a particular value to be entered in a field with the multiplicity of fields of the array" – the transforms produce a magnitude matrix (column 6, lines 2 to

4: Figure 1); a 2D time frequency distribution 156 has a plurality of frequency bins across a vertical axis (“frequency . . . as dimensions”), and a plurality of time windows across a horizontal axis (“and time . . . as dimensions”) (column 9, lines 5 to 13: Figure 2); magnitude matrix contains coefficients that represent an approximate mean spectral density (“amplitude as a particular value to be entered in a field”) of the input signal, or an implicit power spectral density (column 6, lines 5 to 17 column 9, lines 56 to 60); the mean spectral density is represented by magnitude values X_m^D for each element of the matrix illustrated in Figure 2, where the magnitude values are equivalent to amplitudes; a magnitude matrix is represented by MSD function coefficients, which are equivalent to “the amplitude” of a “field” of “a two-dimensional array" because each MSD function coefficient represents a magnitude for a frequency component at a given time;

“assigning a priority to each group of the plurality of field groups, the priority of one group over another group becoming greater based upon the selection of one or more of the following functions: (i) the greater the amplitudes of the group’s values and/or (ii) the greater the amplitude differences of the values of a group and/or (iii) the closer the group is to the current time” – matrices are quantized and priority ordered into a data packet, with the least perceptually relevant information at the end of the packet (Abstract); coefficients of the quantized matrices are prioritized based on the spectral frequency and modulation frequency (column 3, lines 40 to 44); implicitly, a modulation frequency represents a change, or modulation, of an amplitude of a frequency component from frame to frame (“the greater the amplitude differences”);

“sorting the field groups of said array with the aid of their priority value” – the prioritized coefficients are then encoded into the data packet in priority order, so that the most perceptually relevant coefficients are adjacent to the beginning of the data packet and the least perceptually relevant coefficients are adjacent to the end of the packet (column 3, lines 44 to 49); the final step prior to the transmission of the encoded data is perceptual ordering; an example of perceptual ordering is to put the highest priority elements of the magnitude and phase matrix into the bit stream packet first, where low modulation frequencies have priority over higher modulation frequencies (column 11, line 61 to column 12, line 3); ordering the coefficients by perceptual priority is equivalent to "sorting the field groups" by "their priority value";

“storing and/or transmitting the groups to the at least one receiver in the sequence of their priority” – matrices are quantized and priority ordered into a data packet, with the least perceptually relevant information at the end of the packet (Abstract); the prioritized coefficients are then encoded into the data packet in priority order, so that the most perceptually relevant coefficients are adjacent to the beginning of the data packet and the least perceptually relevant information are adjacent to the end of the packet (column 3, lines 41 to 53); the most perceptually relevant information can be sent, stored, or otherwise utilized, using the available channel capacity (column 3, lines 50 to 53); in addition to its use in producing data packets for transmission over a network, the present invention is equally applicable in creating data packets that require less storage space on a storage medium (column 10, lines 62 to 65); the ordered data are packed into a bit stream packet (column 12, lines 4 to 7).

Concerning independent claim 1, the only elements not clearly disclosed by *Atlas et al*. are “combining each field of the multiplicity of fields into a field group” and “forming a plurality of field groups from each individual field and at least two fields of the array adjacent to the individual field”. *Atlas et al*. suggests that fields may be combined into field groups because MSD function coefficients (“fields”) may be extracted from frequency groups approximately representing the critical band structure of the human auditory system. (Column 6, Lines 35 to 39) Moreover, MSD function coefficients are encoded into a data packet by a run length coder to remove redundancy. (Column 7, Lines 1 to 3) Implicitly, run length coding of MSD function coefficients combines identical adjacent coefficients by a single symbol in the same manner that run length coding of pixels combines identical adjacent pixels by a single symbol. Similarly, *Atlas et al*. discloses auditory notes, which are equivalent to combining adjacent fields because a note has a plurality of frequency components and time components. However, *Atlas et al*. does not clearly disclose that priority is assigned based on greater amplitude values or greater amplitudes differences, although it is contended that a modulation frequency represents a change in amplitude of frequency components between frames.

Concerning independent claim 1, *Yong* teaches a prioritization method and device for speech frames coded by a linear predictive coder, where a priority is assigned to a selected speech frame based on at least an energy (“amplitude”) of the speech frame. (Abstract) A priority is assigned to each selected speech frame that protects against loss of perceptually important and/or hard-to-reconstruct speech

frames based on a comparison of priorities assigned to selected immediately previous speech frames. (Column 3, Lines 43 to 57) One method assigns a high priority to high energy speech frames and a low priority to low energy speech frames. (Column 5, Line 68 to Column 6, Line 2) *Yong* provides for “combining each field . . . into a field group" and "forming a plurality of field groups . . . from at least two fields of the array adjacent" because assigning of priority is based on a current speech frame (CSF) and one or more immediately preceding speech frames (IPSF). (Column 2, Lines 35 to 59: Figure 2) An ONSET or NON-ONSET condition is set by grouping a plurality of frames as to whether they have a large variation from their preceding speech frames or that are a beginning of a talkspurt. (Column 4, Lines 61 to 66; Column 6, Lines 7 to 21) *Yong* states an objective for prioritization of speech frames in a linear predictive coder is to protect against loss of perceptually important information. (Abstract) It would have been obvious to one having ordinary skill in the art to apply a prioritization method in a time domain for linear predictive coding to group fields for calculating priority as taught by *Yong* in a perceptually ranked signal coding method based on a time-frequency matrix of *Atlas et al*. for a purpose of protecting against loss of perceptually important information.

Concerning claim 2 and 3, *Atlas et al*. discloses that magnitude matrices are priority ordered so that the least relevant information may be placed at the end of the packet (Abstract; column 3, lines 44 to 49); depending upon the channel capacity, the least perceptually relevant information may not be added to the data packet before

transmission; alternatively, the least perceptually relevant information may be truncated from the data packet (column 3, lines 50 to 57); fine grain scalability can be achieved by truncating a frame at any point above a predefined minimum threshold before transmission determined by available bandwidth, with a minimal adverse impact on the perceived quality of the perceptual data (column 12, lines 4 to 19); thus, either "the entire audio signal . . . is processed and transmitted in its entirely" by placing the least relevant information at the end of the packet, or "only a portion of the audio signal is processed and transmitted" when the least perceptually relevant information may not be added to, or is truncated from, the data packet as determined by available bandwidth.

Concerning claim 7, *Atlas et al*. discloses a decoder 200 receives a packet, and reverses the encoding process, yielding standard PCM code for playback (column 11, lines 10 to 35: Figure 9); applications include listening, sampling, or purchasing music via electronic distribution systems or broadcast systems, or for progressive playback of music (column 13, lines 1 to 59); implicitly audio systems operate on electric signals.

Claims 4 to 6 are rejected under 35 U.S.C. 103(a) as being unpatentable over *Atlas et al*. in view of *Yong* as applied to claim 1 above, and further in view of *Levine et al*.

Concerning claims 4 and 5, *Atlas et al*. discloses a two-dimensional transform process involving a time domain aliasing canceling filter bank, a modified discrete cosine transform (MDCT), and a modified discrete sine transform (MDST) for producing magnitude values X_m^D for each element of the matrix. (Column 8, Line 1 to Column 9,

Line 60: Figure 2) A modified discrete cosine transform (MDCT), and a modified discrete sine transform (MDST) are somewhat more complex representations of a Fast Fourier Transform (FFT) and a number n of frequency selective filters, because *Atlas et al.* is concerned with preserving phase information. However, *Atlas et al.* does disclose a filter bank, which is equivalent to “a number n of frequency selective filters.” In any event, it is well known that there are a plurality of art recognized alternative ways of transforming a signal into its individual frequency components by Fourier analysis, and that filter banks (“a number n of frequency selective filters”) and a Fast Fourier Transform are among the most common alternatives. Specifically, *Levine et al.* teaches a system and method for multiresolution scalable audio signal encoding, where a multi-complementary filter bank 132 splits an input audio signal into several octave-band signals 136 on lines 138-1 to 138-n for bands 1 to n. (Column 5, Line 19 to Figure 6, Line 17: Figure 1: Table 1) Then, a sinusoidal component identifier 140 is implemented using a short time frame FFT to identify spectral peaks within each band signal 136. Sinusoidal component parameters 142 are produced by the FFT analysis to give a parameter tuple representing frequency, amplitude, and phase of each identified spectral component. (Column 6, Lines 18 to 50: Figure 1) An objective is to identify deterministic or sinusoidal components, transient components representing the onset of notes or other events in an audio signal, and stochastic components, so that compressed encoded audio data can meet a specified transmission bandwidth limit. (Abstract) It would have been obvious to one having ordinary skill in the art to substitute art recognized alternatives of an FFT and a number n of frequency selective filters as

taught by *Levine et al*. for the filter bank, MDCT, and MDST of *Atlas et al*. for a purpose of reducing bandwidth by identifying transient components representing the onset of notes for an audio signal.

Concerning claim 6, *Atlas et al*. omits interpolation at a receiver of values still to be transmitted from already available values due to the assigned prioritization. However, it is fairly well known to interpolate lost packets from available data in audio coders operating according to a standard of MPEG. Specifically, *Levine et al*. teaches a system and method for multiresolution scalable audio signal encoding, where a missing packet can be estimated by interpolating from values received in the data packets before and after a lost packet when a packet happens to be lost in transmission. (Column 13, Lines 13 to 20) An objective is to identify deterministic or sinusoidal components, transient components representing the onset of notes or other events in an audio signal, and stochastic components, so that compressed encoded audio data can meet a specified transmission bandwidth limit. (Abstract) It would have been obvious to one having ordinary skill in the art to interpolate values still to be transmitted from already available values as taught by *Levine et al*. in a method of multiresolution scalable audio coding of *Atlas et al*. for a purpose of reducing bandwidth by identifying transient components representing the onset of notes for an audio signal.

Response to Arguments

Applicant's arguments filed 26 November 2008 have been fully considered but they are not persuasive.

Firstly, Applicant states that he has amended independent claim 1 to address the concerns with respect to the rejection under 35 U.S.C. §112, 2nd ¶, and submits that the rejection is overcome by the amendment.

However, it is maintained that Applicant has improved the claim language by the amendment, but that the claim is still somewhat misleading because step (c) directed to combining each field is not actually distinct from step (d) of forming a plurality of field groups. That is, when Applicant combines the fields, then a plurality of field groups are formed, so that a separate step of forming the field groups is not required. One way to resolve this issue is incorporate the combining and forming steps, so as to recite: "(c) combining each field of the multiplicity of fields into a field group, where there are a plurality of field groups formed from the multiplicity of fields, and each field group is formed from at least three adjacent fields". Thus, the claim language should not suggest that there is an additional step of forming field groups that is distinct from combining the fields, as forming the field groups necessarily follows from combining the fields.

Secondly, Applicant presents arguments directed to showing that *Atlas et al*. fails to disclose the step of assigning a priority to each group. Applicant compares prioritization to assembling components of a vehicle in an automobile race, where there is a prioritization of steps and tasks in order to prepare the vehicle for the race that is completely independent of a prioritization of vehicles in the line-up for the race. Applicant says that his prioritization is not the same as the prioritization of *Atlas et al*. This position is traversed.

It is not clear what Applicant is attempting to show by the analogy to an automobile race, except that there may be different non-analogous varieties of prioritization. However, it is maintained that the prioritization of *Atlas et al*. is directed the same purpose as that disclosed by Applicant. *Atlas et al*. prioritizes data packets in accordance with perceptual significance, so that if packets are subsequently lost, then the most perceptually important packets are transmitted first, and maximum signal quality is achieved without significant losses, thereby achieving scalability. Applicant may be trying to suggest, through the automobile race analogy, that the prioritization of *Atlas et al*. is somehow non-analogous to the prioritization of *Yong*. It is true that *Atlas et al*. and *Yong* are directed to different method of coding audio signals: *Atlas et al*. performs audio coding of frequency groups in a frequency domain representation, while *Yong* performs audio coding of linear prediction coefficients in a time domain representation. However, *Yong* is similarly directed to prioritization based upon perceptual importance so as to address the problem of lost packets.

Thirdly, Applicant argues that the weighting factors computed by the perceptual model of *Atlas et al*. are being misapplied by the rejection. Applicant maintains that *Atlas et al*. does not teach ‘combining the fields used for calculating the priority value into a field group’. This argument is not persuasive.

However, independent claim 1 does not recite the limitation of “combining the fields used for calculating the priority value into a field group”, and it is unclear to what purpose Applicant points to the weighting factors of *Atlas et al*., as these weighting factors are not a relevant element of the rejection. The claim only actually recites

combining the fields into a field group, and the assignment of priority is set forth later in the claim. It is agreed that the MSD function coefficients serve the same purpose as Applicant's fields because MSD function coefficients represents an amplitude of a given frequency component at a given time. Any weighting according to a perceptual model of the human auditory system is only one element of an overall priority ordering of perceptually important data. A rapidly changing component of an audio signal may be more perceptually significant in a priority ordering of coefficients, just as some higher frequency components of the audio signal may be less perceptually significant because the human ear cannot hear them.

Moreover, *Atlas et al*. discloses combining the fields in a field group because MSD function coefficients are extracted as peak values of a critical band structure of the human auditory system. (Column 6, Lines 35 to 39) Implicitly, the critical band structure of the human auditory system represents frequency ranges with non-uniform widths. Thus, *ATRAC: Adaptive Transform Acoustic Coding for MiniDisc*, §2.3, shows that the lower critical bands 0 to 3 have frequency widths of only 100 Hz, while higher critical bands 10 to 12 have frequency widths over 200 Hz. Similarly, *Ali*, Figure 3, shows that the lower critical bands have frequency widths of only about 125 Hz, while higher frequency bands have frequency widths of 500 Hz. Again, *Akagiri*, Figure 4, illustrates the non-uniform widths of the critical bands. To one skilled in the art, then, it should be clear that the critical band structure already groups fields according to frequency in *Atlas et al*. Each critical band will have a grouping of frequency components having widths of 100 Hz to 500 Hz. It follows, implicitly, then, that *Atlas et*

al. groups adjacent fields of frequency components to form a plurality of field groups according to the critical band structure before prioritization. Indeed, *Atlas et al*. expressly uses the term "frequency groups" to describe what each MSD function coefficient represents in a critical band structure. (Column 6, Line 37)

Finally, Applicant argues that there is no teaching or suggestion by *Yong* for the limitation of combining the fields into a field group and forming a plurality of groups from each field. This is not persuasive.

Yong discloses assigning a priority to speech frames based on a current speech frame and one or more immediately preceding speech frames so as to assign priority to a group of speech frames. Applicant cites a portion of the passage of *Yong* presented in the rejection, but has disregarded the portion disclosing assigning priority to a number of speech frames including a current speech frame (CSF) and an immediately preceding speech frame (IPSF). (Column 2, Lines 41 to 59) Generally, *Yong* says that a known method involves assigning a high priority to high energy speech frames and a low priority to low energy speech frames. Still, some high energy speech frames may be easy to reconstruct because there is a high correlation between adjacent previously received speech frames. Thus, *Yong* assigns priority not only based not only on the speech energy, but those that have large variation from preceding speech frames, too. (Column 5, Line 68 to Column 6, Line 14) *Yong*, then, provides a teaching that speech frames should be grouped based upon how different they are from preceding speech frames as well as the energy, or amplitudes, of the group's values.

Therefore, the rejections of claims 1 to 3 and 7 under 35 U.S.C. §103(a) as being unpatentable over *Atlas et al*. in view of *Yong*, and of claims 4 to 6 under 35 U.S.C. §103(a) as being unpatentable over *Atlas et al*. in view of *Yong*, and further in view of *Levine et al*., are proper.

Conclusion

The prior art made of record and not relied upon is considered pertinent to Applicant's disclosure.

ATRAC: Adaptive Transform Acoustic Doding for MiniDisc, Ali, and Akagiri disclose art directed to the critical band structure of the human auditory system.

Singhal disclose related art.

THIS ACTION IS MADE FINAL. Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the mailing date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Martin Lerner whose telephone number is (571) 272-7608. The examiner can normally be reached on 8:30 AM to 6:00 PM Monday to Thursday.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, David R. Hudspeth can be reached on (571) 272-7843. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/Martin Lerner/
Primary Examiner
Art Unit 2626
January 8, 2009